## 2009 GROUNDWATER MONITORING **WORK PLAN** Boeing Former C-6 Facility 19503 South Normandie Avenue Los Angeles, California February 17, 2009 PREPARED FOR The Boeing Company 4501 Conant Street Building 851, M/C D851-0097 Long Beach, California 90808

#### PREPARED BY

Avocet Environmental, Inc. 16 Technology Drive, Suite 154 Irvine, California 92618-2327

Project No. 1155.006





February 17, 2009

Project No. 1155.006

Ms. Ana Townsend CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION 320 West 4th Street, Suite 200 Los Angeles, California 90013

2009 Groundwater Monitoring Work Plan
Boeing Former C-6 Facility
19503 South Normandie Avenue
Los Angeles, California

Dear Ms. Townsend:

Enclosed is the 2009 Groundwater Monitoring Work Plan for the subject site. If you have any questions or require additional information, please do not hesitate to call.

Respectfully submitted,

AVOCET ENVIRONMENTAL, INC.

Muhael A Jenolina Michael A. Rendina, P.G.

Principal

MAR:sh

Enclosure

cc: Ms. Jennifer Wiley – The Boeing Company (PDF only)

Mr. Joe Weidmann – Haley & Aldrich (PDF only)

Mr. Ravi Subramanian – CDM (PDF only)

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#### LIST OF ABBREVIATIONS AND ACRONYMS

BCRE Boeing Corporate Real Estate

bgs below ground surface
B-Sand Middle Bellflower B-Sand

Cal/OSHA California Division of Occupational Safety and Health

CDM Camp Dresser & McKee, Inc. C-Sand Middle Bellflower C-Sand

DO dissolved oxygen

EPA U.S. Environmental Protection Agency

gpm gallon per minute

HASP Health and Safety Plan
ILM Industrial Light Metals
IRZ In-situ Reactive Zone

LARWQCB Los Angeles Regional Water Quality Control Board

LBF Lower Bellflower aquitard

L/min liter per minute

MBFM Middle Bellflower Mud mg/L milligram per liter

mL milliliter

mL/min milliliter per minute

MRP Monitoring and Reporting Program

mS/cm milliSiemen per centimeter

mV millivolt

NTU nephelometric turbidity unit

OSHA Occupational Safety and Health Administration

PID photo-ionization detector

QA quality assurance QC quality control

RPM Boeing Real Property Management

UBF Upper Bellflower aquitard

μg/L microgram per liter

VOC volatile organic compound WDR Waste Discharge Requirement



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#### 1.0 INTRODUCTION

Avocet Environmental, Inc. (Avocet), on behalf of Boeing Real Property Management (RPM), has prepared this work plan for continuing groundwater monitoring at The Boeing Company (Boeing's) Former C-6 Facility (the site) in Los Angeles, California (Figure 1). More than 50 groundwater monitoring events have been performed at the site since 1987 and two monitoring events are planned for 2009, as listed below:

- · A site-wide annual event in March.
- A plume-boundary-specific semiannual monitoring event in September.
- If additional monitoring wells are installed during 2009, they will be added to the quarterly sampling program and sampled for four consecutive quarters.

This work plan identifies the groundwater monitoring wells that will be sampled and the constituents and parameters that will be measured during each event. Groundwater monitoring activities related to ongoing bioremediation pilot tests are discussed in the Addendum to Building 1/36 (Parcel C) Source-Area Groundwater In-Situ Reactive Zone Pilot Study Workplan (Camp Dresser McKee, Inc. [CDM], February 1, 2007) and the Addendum No. 2 to the Building 2 In-Situ Reactive Zone Pilot Test Workplan, C-Sand Bioremediation Amendment Injections (CDM, January 25, 2008). This sampling program is separate from, but may overlap, groundwater monitoring program(s) anticipated for 2009 under Monitoring and Reporting Program (MRP) No. CI-9310 and Individual Waste Discharge Requirements (WDR) Order No. R4-2007-0040 related to groundwater remediation. Results from the WDR monitoring program(s) will be submitted in separate reports. This work plan presents the site background, the proposed groundwater monitoring program, and the reporting.

#### 1.1 BACKGROUND

The Former C-6 Facility comprises approximately 170 acres and is bounded by 190th Street to the north; Normandie Avenue to the east; former industrial parcels, including the Montrose Chemical Superfund site (Montrose), to the south; and the former Industrial Light Metals (ILM) site to the west (Figure 1). Between approximately 1952 and 1992, the site was used for aerospace manufacturing operations. Operations at the site ceased in the mid-1990s, the buildings were demolished, and most of the parcels were sold and redeveloped for commercial/light industrial uses. Environmental studies conducted at the site since the 1980s indicate that groundwater beneath the site contains volatile organic compounds (VOCs). These VOCs have been the focus of past and continuing remediation efforts at the site.

#### 1.1.1 Site Geology

The site is located on the Torrance Plain physiographic area of the West Coast Basin and is underlain by the Lakewood Formation. The Lakewood Formation is subdivided into two



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principal hydrostratigraphic units: the Bellflower unit and Gage aquifer. The Bellflower unit is further subdivided into the following:

- Upper Bellflower aquitard (UBF)
- Middle Bellflower B-Sand (B-Sand)
- Middle Bellflower Mud (MBFM)
- Middle Bellflower C-Sand (C-Sand)
- Lower Bellflower aquitard (LBF)

The UBF comprises the upper 20 to 60 feet of the Bellflower unit and consists of fine-grained soils (predominantly fine sands, silts, and clays), which thicken to the east. A sandy zone (Middle Bellflower Sand) that dips downward to the east underlies the fine-grained soils. The Middle Bellflower Sand is generally 60 to 100 feet thick and is a massive, light yellowish-brown, fine to medium sand with discontinuous layers of fine-grained sediment (silt and clay) that also dip downward to the east. A fine-grained layer, referred to as the Middle Bellflower Mud (MBFM), locally interrupts this sand. The top sand subunits are referred to as the B-Sand and the bottom sand subunits as the C-Sand. The MBFM is discontinuous across the site, but where present, ranges in thickness from about 1 foot to 13 feet and is comprised of laminated clay, silt, and very fine sand. The MBFM thins toward the north and appears to be absent in the northern portion of the site (most of the former Building 1/36 portion of the site).

The Middle Bellflower Sand is underlain by the Lower Bellflower aquitard (LBF), another fine-grained zone, at depths ranging from about 120 to 140 feet below ground surface (bgs). The fine-grained LBF ranges in thickness from 10 to 20 feet and appears to be continuous across the site. The LBF separates the Middle Bellflower Sand from the underlying Gage aquifer.

#### 1.1.2 Site Hydrogeology

Groundwater at the site is encountered at depths of approximately 55 to 70 feet bgs in the relatively permeable sediments of the Bellflower unit. Most of the groundwater monitoring wells at the site have been installed in the B- and C-Sands within the Bellflower unit.

The B-Sand is found at approximate depths of 55 to 70 feet bgs at the site, and is generally 25 to 40 feet thick. The B-Sand consists of predominately interbedded fine sands and silts. The most recent (September 2008) groundwater monitoring data for the site (Avocet, November 28, 2008) indicate the groundwater flow within the B-Sand to be predominantly toward the south and southwest with an average gradient of 0.0008 ft/ft.

The C-Sand is found at approximate depths of 90 to 110 feet bgs at the site and extends to depths of 120 to 140 feet bgs. The C-Sand consists largely of interbedded very fine sands with silt and clay. Groundwater flow within the C-Sand is predominantly to the south, with an average gradient of 0.0008 ft/ft (Avocet, November 28, 2008).

The Gage aquifer in the site vicinity occurs at an approximate depth of 150 feet bgs and ranges in thickness from 40 to 50 feet (Haley & Aldrich, Inc., December 8, 2005). The Gage aquifer is



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comprised largely of sand. Groundwater flow within the Gage aquifer is generally to the southeast with an average gradient of 0.0006 ft/ft (Avocet, November 28, 2008).

#### 1.2 GROUNDWATER MONITORING WELL SUMMARY

Groundwater wells installed at the site are classified as follows:

- Groundwater monitoring wells installed by RPM and its predecessors (prefixes include DAC, EWB, IRZ, MWB, TMW, WCC, CMW, EWC, IWC, MWC, and MWG).
- Groundwater monitoring wells installed by ILM for investigations at its facility (prefix BL).
- Groundwater monitoring wells installed by Montrose for investigations at its facility (prefix XMW).

Groundwater investigations began in early 1987 with the installation of the first groundwater monitoring wells. A total of 88 groundwater monitoring wells have since been installed at the site. Twenty of these groundwater monitoring wells have been decommissioned as a result of redevelopment activities.

As of December 2008, a total of 68 groundwater monitoring wells exist at the site. This includes the 13 bioremediation groundwater monitoring wells (10 B-Sand and 3 C-Sand wells) installed in the southern portion of the site to monitor the effectiveness of a now-completed In-situ Reactive Zone (IRZ) bioremediation pilot test. Completion details for all 68 groundwater monitoring wells are included in Table 1 and the well locations are shown in Figure 2.

More than 50 groundwater monitoring events have taken place at the site since monitoring began in 1987. All of the groundwater monitoring wells were typically sampled during each groundwater monitoring event, performed quarterly, until 1997. In 2000, the groundwater monitoring program was modified to two events per year: one full annual monitoring event and one plume-boundary-specific semiannual monitoring event (Kennedy Jenks Consultants, Inc., December 15, 2000).

<sup>&</sup>lt;sup>1</sup> This total does not include the numerous bioremediation amendment wells, most of which are not accessible from above.



#### 2.0 PROPOSED GROUNDWATER MONITORING PROGRAM

The proposed 2009 groundwater monitoring program consists of two sampling events:

- A site-wide annual event in March 2009.
- A plume-boundary-specific semiannual monitoring event in September 2009.

The above events are described in Sections 2.1 and 2.2. General monitoring considerations are described in Section 2.3. The monitoring program is presented in Table 2 and Figures 3 and 4. As stated previously, this monitoring is separate from, but may overlap, WDR-specific groundwater monitoring being performed at the site. At times during the monitoring events, sampling at certain wells will concurrently satisfy both groundwater monitoring and WDR-specific monitoring requirements. In addition, if any monitoring wells are installed during 2009, they will be added to the quarterly sampling program and sampled for four consecutive quarters.

Some additional sampling and analyses, as appropriate, are also proposed for certain wells to collect additional data for evaluating remedial activities at the site.

#### 2.1 ANNUAL GROUNDWATER MONITORING

The site-wide annual monitoring event will be performed in March 2009. Groundwater monitoring will be performed at 52 groundwater monitoring wells and 7 bioremediation monitoring wells, as indicated in Table 2 and shown in Figure 3. This task will consist of the following activities:

- Measure static groundwater in 64 groundwater monitoring wells.
- Measure field parameters, including pH, temperature, specific conductance, dissolved oxygen (DO), and redox potential, using a calibrated sonde and flow-through cell at 59 wells<sup>2</sup>. A turbidity meter (Hach 2100P or equal) will be used to periodically measure turbidity of the water during purging.
- Analyze 10 percent of the samples in the field using a CHEMetrics, Inc. test kit (K-7512 or K-7540) as a quality assurance (QA) check on DO measurements.
- Collect groundwater samples from the 59 monitoring wells and analyze for VOCs by EPA Method 8260B.

<sup>&</sup>lt;sup>2</sup> The number of wells proposed for sampling (59) reflects a four-well reduction from the 63 proposed in the 2008 Groundwater Monitoring Work Plan (Avocet, February 4, 2008). The four wells were eliminated from the annual program because they duplicate the results of nearby wells. Wells EWC002, IWC002, IRZB0081 and IRZB0095 were eliminated because they are duplicated by MWC024, IRZCMW001, IRZMW005, and IRZMW004, respectively. Concentration-versus-time graphs illustrating the close agreement of water quality analyses from these wells are presented in Appendix B.



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- Collect quality control (QC) samples consisting of duplicates (1 per 20 wells) and equipment/rinsate and trip blanks (each at a rate of 1 per day of sampling).
- Perform data validation on approximately 10 percent of the laboratory data for the primary samples as described in Section 2.3.7.4.

The monitoring methodology is presented in Section 2.3. If selected wells cannot be accessed for any reason, they will be scheduled for gauging and sampling during the next sampling event. Groundwater monitoring wells installed at the site by Montrose and ILM will be accessed through coordination with their respective environmental contractors.

#### 2.2 SEMIANNUAL GROUNDWATER MONITORING

The semiannual monitoring event will be performed in September 2009. Groundwater monitoring will be performed at a reduced number (30)<sup>3</sup> of groundwater monitoring wells, as indicated in Table 2 and shown in Figure 4, and will focus primarily on the boundaries of the groundwater plumes. This task will consist of the following activities:

- Measure static groundwater in 40 groundwater monitoring wells.
- Measure field parameters, including pH, temperature, specific conductance, DO, and redox potential, using a calibrated sonde and flow-through cell, at 30 wells.
   A turbidity meter will be used to periodically measure turbidity.
- Analyze 10 percent of the samples in the field using a CHEMetrics, Inc test kit (K-7512 or K-7540) as a quality assurance (QA) check on DO measurements.
- Collect groundwater samples from 30 monitoring wells and analyze for VOCs using EPA Method 8260B.
- Collect QC samples consisting of duplicates (1 per 20 wells) and equipment/rinsate and trip blanks (each at a rate of 1 per day of sampling).
- Perform data validation on approximately 10 percent of the laboratory data for the primary samples, as described in Section 2.3.7.4.

The monitoring methodology is presented in Section 2.3. If selected wells cannot be accessed for any reason, they will be scheduled for gauging and sampling during the next sampling event.

<sup>&</sup>lt;sup>3</sup> The number of wells proposed for sampling (30) reflects the addition of 2 wells from the 28 proposed in the 2008 Groundwater Monitoring Work Plan (Avocet, February 4, 2008). The two wells, MWG003 and MWG004, include the two Gage aquifer wells that were previously sampled annually. All four Gage aquifer wells are now being monitored on a semiannual basis.



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#### 2.3 GROUNDWATER MONITORING METHODOLOGY

#### 2.3.1 Health and Safety

The work will be performed by Avocet under a site-specific Health and Safety Plan (HASP), which has been developed in accordance with the federal Occupational Safety and Health Administration (OSHA) and California Division of Occupational Safety and Health (Cal/OSHA) regulations (Title 29 CFR, Section 1910.120 and 8 CCR 5192).

#### 2.3.2 Groundwater Monitoring and Sampling

RPM will notify the Los Angeles Regional Water Quality Control Board (LARWQCB) a minimum of one week prior to the start of groundwater monitoring events. The activities described in the subsequent paragraphs will be performed.

#### 2.3.3 Water Level Gauging

Prior to sampling each monitoring well, depth to groundwater will be measured to the nearest one-hundredth of a foot using an electronic water level sounder. Data from the well gauging will be recorded in the Groundwater Monitoring Well Gauging Sheet (Appendix A), as well as in an electronic format for upload to the project database. Monitoring well vapor concentrations will be measured with a photoionization detector (PID) following the removal of the well cap, and the results will be recorded on the Gauging Sheet. The Gauging Sheet will also include information on the surface condition of each well and any repairs/modifications required or that may have been conducted. During each monitoring event, all water level measurements will be collected within a single 24-hour period using water sounding tapes calibrated to a common standard. Water levels in wells with submerged screens that are noted to be under pressure upon removal of the well cap will be allowed time to stabilize prior to water level gauging.

#### 2.3.4 Well Purging

During each event, groundwater monitoring wells will be sampled in order of increasing concentrations. The sampling order will be determined based on the most recent groundwater analytical data available at the time of sampling and will consider any WDR wells included in the event.

Prior to collecting groundwater samples for chemical analysis, wells scheduled to be sampled will be purged to assure representative samples are collected from the formation. Historically, groundwater sampling conducted for site characterization was performed using conventional (i.e., three to five wetted casing volumes) purging methods, whereas sampling conducted to monitor in-situ bioremediation has been performed using low-flow (i.e., minimal drawdown) purging methods. On January 15, 2008, a letter report presenting a comparison of historical VOC analytical results for several wells sampled using both low-flow and conventional purging methods was submitted to the LARWQCB (Avocet, January 15, 2008). The comparison revealed a good correlation between sampling methods, and the report stated Boeing's intention to transition to the low-flow sampling method beginning with the March 2008 groundwater



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monitoring event. In a letter to Boeing Corporate Real Estate (BCRE) dated March 4, 2008, the LARWQCB approved Boeing's proposal to use low-flow purging and sampling for the site-wide groundwater monitoring program. Dedicated low-flow pneumatic bladder pumps were installed in 35 wells prior to the March 2008 groundwater monitoring event. The remaining wells were purged and sampled during 2008 using portable low-flow equipment.

#### 2.3.4.1 Low-flow Purging and Sampling

Low-flow purging differs from traditional methods of purging in that its use is based on the observation that water moving through the formation also moves through the well screen. Thus, the water in the screen is representative of the formation water surrounding the screen. Low-flow purging involves removing water directly from the screened interval without disturbing any stagnant water above the screen. This is done by pumping the well at a low enough flow rate to maintain minimal drawdown of the water column within the well, as determined through water-level measurement during pumping. The objective is to pump in a manner that minimizes stress to the groundwater system to the extent practical. Pumping at low rates, in effect, hydraulically isolates the column of stagnant water in the well and negates the need for its removal prior to sample collection. Typically, flow rates on the order of 0.1 to 0.5 liter per minute (L/min) are used; however, this is dependent on site-specific and well-specific factors, as drawdown should be minimized to the extent possible. Pumping water levels in the well and water quality indicator parameters (such as pH, temperature, specific conductance, DO, and redox potential) should be monitored during pumping, with stabilization indicating that purging is completed (i.e., access to formation-quality water is confirmed) and sampling can begin.

Low-flow purging will be conducted using either portable or dedicated, pneumatic (bladder) or electric submersible pumps, as long as the pump has adjustable flow rate controls and is capable of being run at a low enough flow rate to avoid causing continuous drawdown in the well. The pump will be installed with the intake positioned near the mid-point of the well screen (or in water table wells near the mid-point of the saturated well screen interval). After the pump intake is properly set in the well, the pump will be started at a low pumping rate, generally 100 milliliters per minute (mL/min), or if 100 mL/min is not possible, the lowest flow rate possible. From the time the pump is started, the water level in the well will be measured periodically to determine the amount of drawdown caused by the pumping. The pumping rate may then be adjusted, either up or down, until drawdown stabilizes. Although several researchers have proposed limits on the amount of drawdown that should be allowed before stabilization occurs (e.g., 0.33 feet, Puls and Barcelona, 1996), none have provided any scientific rationale for the limits. ASTM International suggests that drawdown be limited to 25 percent of the distance between the top of the well screen and the pump intake; this equates to 2.5 feet in a well with 10 feet of saturated screen interval. Since the objective of low-flow purging is to minimize stress on the formation to the extent practical, and drawdown is a measurable indicator of stress, Avocet will endeavor to limit drawdown prior to stabilization to 0.5 foot or less.

Water quality indicator parameters, including pH, temperature, specific conductance, DO, and redox potential, will be measured in a closed flow-through cell to determine when purging is



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complete and sampling can commence. Though not a chemical parameter, turbidity is an indicator of stress on the formation and turbidity measurements will be recorded, at a minimum, once when pumping is initiated and again just prior to sample collection, after indicator parameters have stabilized. Indicator parameters will be considered stable when three consecutive readings made several minutes apart fall within the following ranges:

- $\pm 0.2$  pH units
- ±3 percent of the specific conductance measurement or 0.02 milliSiemen per centimeter (mS/cm), whichever is greater
- $\pm 10$  percent of the DO reading or  $\pm 0.2$  mg/L, whichever is greater
- ±20 millivolts (mV) for redox potential measurements
- $\pm 10$  percent of the turbidity measurement or  $\pm 1.0$  nephelometric unit (NTU), whichever is greater

The first reading will be recorded after stagnant water has been purged from the pump, discharge tubing, and one volume of the flow cell – about 1 to 2 liters depending on the volume of the flow cell. The frequency of subsequent measurements will be based on the time required to completely evacuate one volume of the flow cell, to ensure that independent measurements are made. Avocet intends to utilize the QED MP20 flow cell, which has a volume of 175 milliliters (mL); therefore, depending on the flow rate; measurements will be recorded every two minutes or less. Groundwater well purge information, including the equipment used, pump placement, initial static and final water levels, initial and final pumping rates, and water quality indicator and turbidity measurements, will be recorded on the Groundwater Sampling Data Sheet, an example of which is included in Appendix A.

#### 2.3.5 Sampling

After drawdown and the chemical indicator parameters stabilize, sampling may begin. Sampling will be performed by disconnecting the inflow line from the flow cell and discharging the water directly into laboratory-supplied sample containers. Samples will be stored on ice in a cooler and transported by courier to a California-certified analytical laboratory for analysis under proper chain-of-custody protocols. Chain-of-custody forms will be maintained throughout sample collection and transport. An example chain-of-custody form is provided in Appendix A. The appropriate chain-of-custody information will also be electronically uploaded to the project database.

#### 2.3.6 Miscellaneous

Non-dedicated equipment used for well purging and sampling will be cleaned prior to and between groundwater monitoring wells with an Alconox solution (or equivalent), then double-rinsed with tap water and deionized or distilled water to reduce the potential for cross-contamination. Well purge water and water used to decontaminate equipment will be stored in properly labeled, UN-approved 55-gallon drums or other approved containers and stored onsite



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at a location selected by RPM. The water will be properly manifested and disposed of by Avocet following receipt of the laboratory results.

Groundwater analytical results will be reported on RWQCB Laboratory Report Forms 10A/10B or their equivalent in units of milligrams per liter (mg/L) or micrograms per liter (µg/L), as appropriate. Field data will be collected and recorded on standard groundwater monitoring forms, and the laboratory data will be submitted electronically for upload to the project database.

#### 2.3.7 Quality Assurance/Quality Control

#### 2.3.7.1 Duplicate Samples

One duplicate groundwater sample will be collected for every 20 groundwater samples as a check for sample homogeneity and laboratory precision (three samples in March and two in September). Duplicates will be collected, packaged, and sealed in the same manner as the primary samples. Duplicates will be assigned separate sample numbers and submitted blind to the laboratory. Duplicate samples will be analyzed for VOCs using EPA Method 8260B.

#### 2.3.7.2 Equipment/Rinsate Blanks

One equipment/rinsate blank sample will be collected prior to the initiation of sampling activities using non-dedicated equipment as a check for cross-contamination. Another sample will be collected each day, throughout the duration of the sampling event, when non-dedicated sampling equipment is cleaned and reused in the field as a check for cross-contamination (an estimated four samples in March and two samples in September). Deionized water, provided by the laboratory and used to prepare the trip blanks, will be used to fill or rinse the sampling equipment after the equipment has been cleaned, then collected in sample containers. The equipment/rinsate blanks will be analyzed for VOCs using EPA Method 8260B.

#### 2.3.7.3 Trip Blanks

One trip blank will be prepared in the laboratory for each day that groundwater samples are collected and shipped to the laboratory (an estimated six samples in March and four samples in September). The trip blanks will be prepared in a clean environment and kept in the cooler used to ship the samples. The trip blank provides a check for contamination during transport and will be analyzed for VOCs using EPA Method 8260B.

#### 2.3.7.4 Data Validation

A subcontractor will perform data validation in accordance with U.S. Environmental Protection Agency (EPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA, 1999 and 2001). Approximately 10 percent of the laboratory data for the primary samples will be reviewed during each monitoring event to verify that the data are of sufficient quality (six samples from the March annual event and three samples from the September semiannual event). The data packages to be validated will be selected randomly. Approximately 80 percent of the selected data packages will be subjected to Tier 1 validation, 10 percent will be



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subjected to Tie	er 2 validation, and 10 percent	will be subjected to Tier	3 validation (Halev &



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#### 3.0 GROUNDWATER MONITORING REPORT

The report for the annual groundwater monitoring event will contain the following:

- Groundwater elevation contour maps for the B-Sand, the C-Sand, and the Gage aquifer
- Hydrographs for select B-Sand, C-Sand, and Gage aquifer wells
- Concentration-versus-time graphs for select wells and select VOCs in the B- and C-Sands
- Groundwater isoconcentration maps for key compounds of concern at the site (trichloroethene and 1,1-dichloroethene) for the B-Sand and C-Sand
- Tables summarizing groundwater analytical results
- Groundwater sampling forms documenting field activities
- Laboratory reports and chain-of-custody documentation
- Data validation reports
- Appropriate descriptions of the field activities and analytical results
- Recommendations for modifications to the sampling program, as appropriate.

The report for the semiannual groundwater monitoring event will contain the following:

- Groundwater elevation contour maps for the B-Sand, the C-Sand, and the Gage aquifer
- Tables and figures presenting the groundwater analytical results
- Groundwater sampling forms documenting field activities
- Laboratory reports and chain-of-custody documentation
- Data validation reports
- Appropriate descriptions of the field activities and analytical results.

Reports will be submitted to the LARWQCB approximately 60 days after receipt of the laboratory results from each sampling event. With the annual and semiannual monitoring events occurring in March and September 2008, reports for these events will be provided to the



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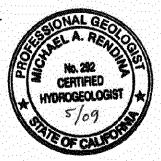
LARWQCB by May 29 and November 30, 2009, respectively. The reports will consist of a hard copy of text, tables, figures, and the appendices containing the field and laboratory data. The reports will also be uploaded over the internet onto the State Water Resources Control Board GeoTracker data management system.

Respectfully submitted,

AVOCET ENVIRONMENTAL, INC.

Michael A. Rendina, P.G.

Principal



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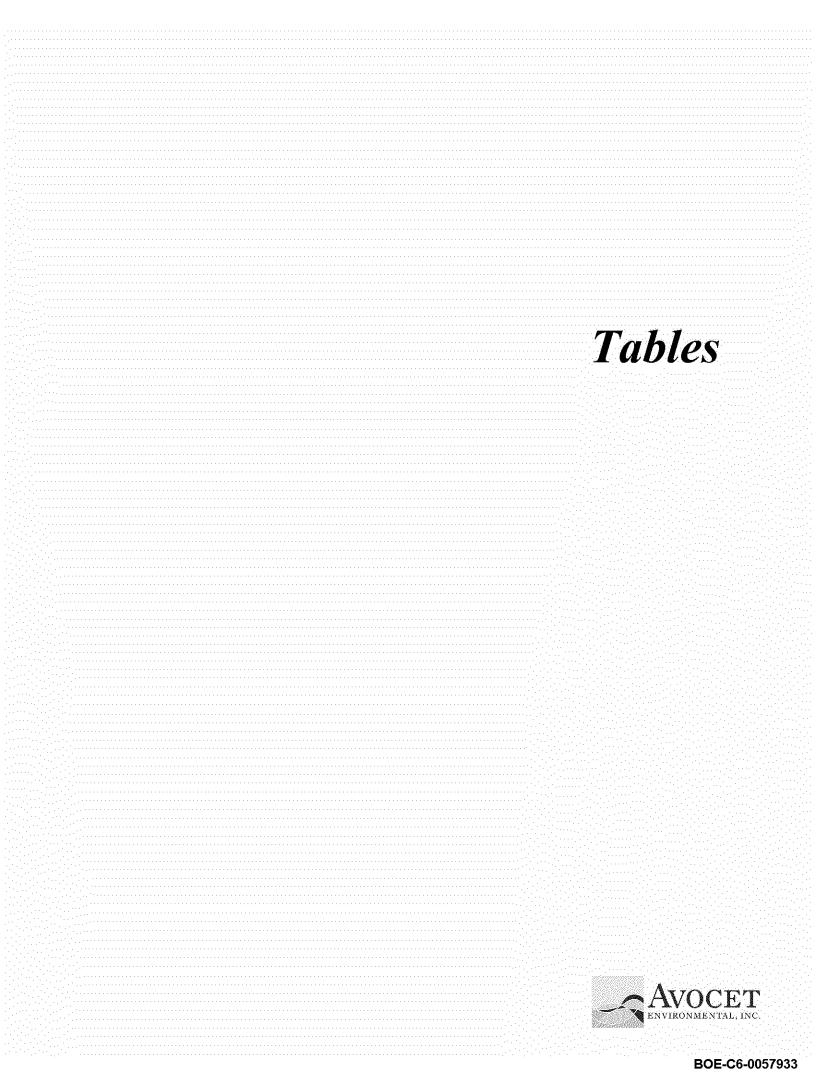
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9240.1-34, EPA540-R-00-006.





Groundwater Monitoring Well Completion Details
Boeing Former C-6 Facility

Los Angeles, California

Well I.D.	Water-Bearing Unit	Easting (1,3)	Northing <sup>(1,3)</sup>	Reference Elevation (feet amsl) <sup>(2)</sup>	Boring Total Depth (feet)	Screen Depth Interval (feet)	Depth to Top of Filter Pack (feet)	Casing Diameter (inches)	Casing Type	Slot Size (inches)	Drilled Date
B-Sand Monitorin	g Wells										
AW0055UB	Upper B-Sand	6,470,304	1,769,863	.53:54	92	69 89	65	2.	Sch 40 PVC	0.02	06/21/05
AW0064UB	Upper.B-Sand	6,470,346	1,769,801	.53.28	92	68.5 - 88.5	66	2.	Sch 40 PVC	0.02	06/21/05
AW0065UB	Upper.B-Sand	6,470,316	1,769,802	.53.64	92	68.5 - 88.5	66	2,	Sch 40 PVC	0.02	06/16/05
AW0066UB	Upper B-Sand	6,470,286	1,769,802	.53.98	91	69.5 - 89.5	67	2.	Sch 40 PVC	0.02	06/14/05
AW0067UB	Upper B-Sand	6,470,261	1,769,810	.54.01	91	70 - 90	67	2	Sch 40 PVC	0.02	06/08/05
AW0074UB	Upper B-Sand	6,470,365	1,769,759	.52.73	91	70 - 90	67	2	Sch 40 PVC	0.02	06/09/05
AW0075UB	Upper B-Sand	6;470,332	1,769,740	53.23	93	69 - 89	66	2	Sch 40 PVC	0.02	06/08/05
AW0076UB	Upper B-Sand	6,470,302	1,769,740	53.69.	92	.69 - 89.	66	2.	Sch 40 PVC	0.02	06/08/05
AW0077UB	B-Sand	6,470,254	1,769,763	53.96	86	70.5 - 85.5	69	2.	Sch 40 PVC	0.02	08/19/04
BL-03	B-Sand	6,468,962	1,768,747	58.66	.79	59 - 79	56	2.	Sch 40 PVC	0.01	02/08/99
DAC-P1	B-Sand	6;468,953	1,769,774	.55:13	90	60 - 90	55	4	Sch 40 PVC	0.01	09/25/89
EWB001(4)	B-Sand	6,470,381	1,769,604	53.01	84.7	59.2 - 89.2	56	6,	Sch. 80. PVC.	0.02	11/09/06
EWB002	B-Sand	6,470,279	1,769,773	53.74	90	60 - 90	56	6	Sch 80 PVC	0.02	06/13/07
MW0005	B-Sand	6,470,232	1,769,063	52.1	85	65 - 85	63	4	Sch 40 PVC	0.01	08/08/03
MWB003	B-Sand	6,470,193	1,769,474	56.95	92	65 - 90	63	2.	Sch 40 PVC	0.02	11/30/05
MWB006	B-Sand	6,470,251	1,770,051	53.9	93	65 - 90	63	2.	Sch 40 PVC	0.02	12/01/05
MWB007	B-Sand	6,470,211	1,770,213	51.39	92	60 - 90	57	4	Sch 40 PVC	0.02	06/06/05
MWB012	B-Sand	6,470,035	1,769,019	52.43	90.5	64.5 - 84.5	62	4	Sch 40 PVC	0.02	05/17/04
MWB013.	B-Sand	6,469,592	1,769,396	55.33	86.5	65 - 85	62	4	Sch 40 PVC	0.02	05/17/04
MWB014	B-Sand	6;470,280	1,768,387	.51.69	86.5	65 - 85	62	4	Sch 40 PVC	0.02	05/17/04
MWB019	B-Sand	6,469,970	1,768,093	55.18	90.5	65 - 85	62	4	Sch 40 PVC	0.02	05/17/04
MWB020	B-Sand	6,470,396	1,770,863	51.07	120.5	59.5 - 89.5	56	4	Sch 40 PVC	0.02	06/06/05
MWB027	B-Sand	6,469,948	1,769,934	57.14	91.5	67.5 - 87.5	65	2.	Sch 40 PVC	0.02	11/30/05
MWB028.	B-Sand	6,470,106	1,769,475	56.84	93	.65 - 90	63	2.	Sch 40 PVC	0.02	12/01/05
TMW_04	B-Sand	6,470,254	1,769,116	51.39	84	.5878	56	2.	Sch 40 PVC	0.01	06/30/98
TMW_06	B-Sand	6,470,299	1,768,718	51.72	93	67 - 87	66	2.	Sch 40 PVC	0.01	07/01/98
TMW_07	B-Sand	6,470,318	1,769,483	53.96	91	65 - 85	63	2	Sch 40 PVC	0.01	06/29/98
TMW_08.	B-Sand	6,470,329	1,769,594	53.98	90	.61 - 81	59	2	Sch-40.PVC	0.01	06/29/98
TMW_10	B-Sand	6,470,723	1,768,951	49:92	85	60.5 - 80.5	58	2.	Sch-40.PVC	0.01	01/28/99
TMW_11	B-Sand	6,470,721	1,768,204	49:85	83	58 - 78	55	2.	Sch-40.PVC	0.01	02/01/99
TMW_14	B-Sand	6,469,550	1,768,199	.58.91	90	65 - 85	63	2.	Sch 40.PVC	0.01	02/03/99
TMW 15	B-Sand	6,469,555	1,768,950	.57:65	92	62 - 87	60	2.	Sch 40.PVC	0.01	02/04/99



Groundwater Monitoring Well Completion Details
Boeing Former C-6 Facility

Los Angeles, California

Well I.D.	Water-Bearing Unit	Easting <sup>(1,3)</sup>	Northing <sup>(1,3)</sup>	Reference Elevation (feet amsl) <sup>(2)</sup>	Boring Total Depth (feet)	Screen Depth Interval (feet)	Depth to Top of Filter Pack (feet)	Casing Diameter (inches)	Casing Type	Slot Size (inches)	Drilled Date
WCC_03S	B-Sand	6,470,367	1,770,021	52.8	92	69 - 89	64	4	Sch 40 PVC	0.01	10/26/87
WCC_04S	B-Sand	6,470,499	1,769,857	52.23	92	70.5 - 90.5	65	4	Sch 40 PVC	0.01	10/27/87
WCC_05S	B-Sand	6,470,722	1,769,779	52.82	91	61 - 91	64	4	Sch 40 PVC	0.01	11/24/87
WCC_06S	B-Sand	6,470,336	1,769,734	52.7	91	.60 90	54	4	Sch-40.PVC	0.01	09/22/89
WCC_07S	B-Sand	6,470,505	1,769,695	52.21	91	.60 90	54	4	Sch-40.PVC	0.01	06/08/89
WCC_09S	B-Sand	6,470,683	1,769,409	54.96	92	.60 90	55	4	Sch-40.PVC	0.01	09/21/89
WCC_12S	B-Sand	6,470,506	1,769,496	.51.32	92	6090	55	4	Sch 40.PVC	0.01	09/17/90
XMW-09	B-Sand	6,470,407	1,767,930	.53.16.	80	61 - 76	-	4	-	-	05/09/89
XMW-19	B-Sand	6,470,722	1,768,538	49.38	80	62 - 77	-	4	-	_	03/30/90
C-Sand Monitorin	g Wells										
AW0073C	C-Sand	6,470,329	1,769,765	53.42	117	96 - 116	93	2	Sch 40 PVC	0.02	06/09/05
CMW001	C-Sand	6,470,700	1,768,183	54.37	124	99 - 124	97	4	Sch 40 PVC	0.01	08/15/03
CMW002.	C-Sand	6,470,554	1,767,936	52.81	124	.99 - 124	97	4	Sch 40 PVC	0.01	08/14/03
CMW026.	C-Sand	6,470,279	1,768,603	51.53	117	.92 - 117	90	4	Sch 40 PVC	0.01	08/06/03
EWC001	C-Sand	6,470,359	1,769,706	.52.59	125	97 - 122	94	4	Sch 80 PVC	0.02	11/08/06
EWC002.	C-Sand	6,470,267	1,768,368	51.76	125	.96121	93	4	Sch 80 PVC	0.02	10/20/06
IWC001	C-Sand	6,470,121	1,768,453	53.6	125	.95;115	92	4	Sch 80 PVC	0.02	11/02/06
IWC002	C-Sand	6,470,239	1,768,669	51.56	125	.96 116	93	4	Sch 80 PVC	0.02	10/31/06
MWC004	C-Sand	6,470,486	1,769,491	51.86	118	.96 116	93	4	Sch 40 PVC	0.02	06/07/05
MWC006.	C-Sand	6,470,252	1,770,037	54.03	117.5	.95 - 115	93	2.	Sch 40 PVC	0.02	11/29/05
MWC007	C-Sand	6,470,172	1,770,172	51.57	119	97 - 117	93.5	4	Sch 40.PVC	0.02	06/03/05
MWC009	C-Sand	6,470,658	1,769,365	53.99	125	101 - 121	97.5	4	Sch-40.PVC	0.02	04/28/05
MWC011	C-Sand	6,470,263	1,769,749	54.03	117	94 - 114	92	2.	Sch-40.PVC	0.02	11/29/05
MWC015.	C-Sand	6,470,304	1,768,821	.51.51	128	100 - 125	99	4	Sch 40.PVC	0.02	05/17/04
MWC016.	C-Sand	6,469,987	1,768,720	.52.61	131	102.5 - 127.5	101	4	Sch 40.PVC	0.02	05/17/04
MWC017	C-Sand	6,469,979	1,768,093	.55:16.	128	100 - 125	99	4	Sch 40.PVC	0.02	05/17/04
MWC021	C-Sand	6,470,705	1,768,939	.54.53	126	.971.22	94.5	4	Sch 40 PVC	0.02	05/17/04
MWC022	C-Sand	6,470,454	1,769,986	51.6	1.20	97 - 117	93.5	4	Sch 40 PVC	0.02	06/07/05
MWC023	C-Sand	6,470,428	1,769,802	.51.43	120	.97,117	94	4	Sch 40 PVC	0.02	06/07/05
MWC024	C-Sand	6,470,266	1,768,409	51.64	.125	.96121	93	4	Sch 80 PVC	0.02	10/26/06



## Table 1 Groundwater Monitoring Well Completion Details

Boeing Former C-6 Facility
Los Angeles, California

Well I.D.	Water-Bearing Unit	Easting <sup>(1,3)</sup>	Northing <sup>(1,3)</sup>	Reference Elevation (feet amsl) <sup>(2)</sup>	Boring Total Depth (feet)	Screen Depth Interval (feet)	Depth to Top of Filter Pack (feet)	Casing Diameter (inches)	Casing Type	Slot Size (inches)	Drilled Date
Bioremediation Mo	onitoring Wells										
IRZB0081	B-Sand	6,470,037	1,768,714	52.92	-	64.5 - 89.5	63	0.75	Sch 40 PVC	0.01	09/04/03
IRZB0095	B-Sand	6,470,038	1,768,619	52.7	-	65 - 90	63.2	0.75	Sch 40 PVC	0.01	09/05/03
IRZMW001A	B-Sand	6,469,844	1,768,988	56.77	-	65 - 75	63	1.5	Sch 40 PVC	0.01	06/26/02
IRZMW001B	B-Sand	6,469,844	1,768,988	56.7	-	80 - 90	79	1.5	Sch 40 PVC	0.01	06/26/02
IRZMW002A	B-Sand	6,469,840	1,768,989	56.66	-	.6878	66	1.5	Sch 40 PVC	0.01	06/03/03
IRZMW002B	B-Sand	6,469,840	1,768,989	56.76	-	83 - 93	82	1.5	Sch 40 PVC	0.01	06/03/03
IRZMW003A	B-Sand	6,469,867	1,768,985	56.73	-	61 - 71	60	1.5	Sch 40 PVC	0.01	06/02/03
IRZMW003B	B-Sand	6,469,867	1,768,985	56.78	-	.80 - 90	79	1.5	Sch 40 PVC	0.01	06/02/03
IRZMW004	B-Sand	6,470,051	1,768,610	53.06	-	.65:-90	63	4	Sch 40 PVC	0.01	09/04/03
IRZMW005	B-Sand	6,470,038	1,768,708	52.77	-	.65:-90	63	4	Sch 40 PVC	0.01	09/05/03
IRZCMW001	C-Sand	6,470,218	1,768,660	51.74	117	.92 - 117	90	4	Sch 40 PVC	0.01	08/06/03
IRZCMW002	C-Sand	6,470,417	1,768,410	55.6	121	.96 121	94	4	Sch 40 PVC	0.01	05/12/04
IRZCMW003	C-Sand	6,470,298	1,768,593	51.69	117	.92 - 117	90	4	Sch 40 PVC	0.01	08/08/03
Gage Aquifer Mon	itoring Wells										
MWG001	Gage Aquifer	6,470,706	1,769,149	54.13	190	156 - 186	152	2	Sch 40 PVC	0.02	04/22/05
MWG002	Gage Aquifer	6,470,705	1,768,452	54.78	195	162 - 192	158	2.	Sch 40 PVC	0.02	04/28/05
MWG003	Gage Aquifer	6,470,056	1,768,915	.53.079.	185	154.5 - 184.5	150	2.	Sch 40 PVC	0.02	09/12/05
MWG004	Gage Aquifer	6,470,230	1,768,389	52.049	186	155 - 185	150	2	Sch 40 PVC	0.02	09/12/05

#### Notes:

- (1) California State Plane North American Datum of 83 (NAD 83), Zone 5, Feet
- (2) feet amsl = feet above mean sea level; elevations based on North American Vertical Datum of 1988 (NAVD 88)
- (3) Coordinates were slightly revised based on additional survey done in November 2006
- (4) Well EWB001 contains a permanent pump. The top of casing was modified when a vault was installed. Total depth (below top of casing [BTC]) prior to modification was 88.7 feet. Total depth after modification is 84.7 feet (i.e., approximately 4 feet of casing was removed during vault installation).



 $n_{-}^{-n} = nnknown$ 

## Table 2 2009 Groundwater Monitoring Program

Boeing Former C-6 Facility
Los Angeles, California

200000000000000000000000000000000000000	Water-Bearing	Dedicated	Annual E	March 2009 Vent Analytic			September 20 nual Analytica	and the second s
Well ID	Unit	Pump?	Water Level Gauging	VOCs (8260B)	Field Parameters <sup>(1)</sup>	Water Level Gauging	VOCs (8260B)	Field Parameters <sup>(1)</sup>
B-Sand Monito	ring Wells							
BL-03	B-Sand	No.	х	х	x.	х		
DAC-P1	B-Sand	No.	х	х	X.	x		
EWB001	B-Sand	No:	x	х	х			
EWB002	B-Sand	Yes	X	х	х			
MW0005	B-Sand	No:	X	х	х	х		
MWB003.	B-Sand	No.	х	х	х			
MWB006.	B-Sand	No.	х	.x	х			
MWB007	B-Sand	Y.es	х	х	х	, <b>X</b> .	, <b>X</b> ,	, <b>X</b> .
MWB012	B-Sand	No.	х	х	х			
MWB013.	B-Sand	Yes	х	х	х	, <b>X</b> .	. <b>X</b>	.X.
MWB014	B-Sand	No.	х	х	х	х		
MWB019	B-Sand	Yes	.x	х	х	. <b>X</b> .	.X	х
MWB020	B-Sand	Yes	.x	х	х	·X·	.X	· <b>X</b> ·
MWB027	B-Sand	Yes	.X	.x	х	·X·	.X	·X·
MWB028	B-Sand	No.	·x	х	х	х		
TMW_04	B-Sand	No.	·X					
TMW_06	B-Sand	No.	·X	х	х	х		
TMW, .07	B-Sand	Yes	·X	х	х			
TMW. 08.	B-Sand	No.	·X	х	x			
TMW_10.	B-Sand	Yes	·X	х	х	·X·	·X .	X
TMW. 11	B-Sand	Yes	·X	х	х	×	·x	·X·
TMW_14	B-Sand	Yes	·x	х	х	х	х	х
TMW_15	B-Sand	Yes	·X	X	X.	X	х	·X
WCC.3S	B-Sand	Yes	х	·X	X.	X	·X	х
WCC 4S	B-Sand	Yes	х	х	X.	_X_	x	х
WCC_5S	B-Sand	Yes	х	х	X.	, X,	х	x
WCC_6S	B-Sand	No.	х	х	х		·	
WCC_7S	B-Sand	Yes	х	х	х	, <b>X</b> .	.x	X.
WCC 9S	B-Sand	Yes	х	х	х	х.	x	х
WCC_12S	B-Sand	Yes	.X	X	х	, <b>X</b> .	х	,X
XMW-09	B-Sand	No.	.x	.x	х	, <b>X</b> .	x	, <b>X</b> .
XMW-19	B-Sand	No.	.x	х	х	, <b>X</b> .	x	, <b>X</b> -
C-Sand Monito	ring Wells							
CMW001	C-Sand	Yes	·X	х	х	<b>X</b> .	· <b>X</b> .	. <b>X</b> .
CMW002	C-Sand	Yes	·X	х	х	X	Х.	X
CMW026	C-Sand	Yes	Х	х	х			
EWC001	C-Sand	No.	·X	х	х			
EWC002	C-Sand	No				x		
IWC001	C-Sand	No	·X	X	x.	x		
IWC002	C-Sand	No						
MWC004.	C-Sand	Yes	х	·X	X-	х	Х	х
MWC006	C-Sand	No.	X	х	X.			
MWC007	C-Sand	Yes	х	x	X.	, <b>X</b> ,	X	х
MWC009	C-Sand	Yes.	х	х	х	Х.	Х	х
MWC011	C-Sand	No:	x	х	х	l	<del></del>	



#### Table 2

#### 2009 Groundwater Monitoring Program

Boeing Former C-6 Facility Los Angeles, California

Well ID	Water-Bearing	Dedicated	Annual E	March 2009 vent Analytic			September 20 ual Analytica	
WellID	Unit	Pump?	Water Level Gauging	<b>VOCs</b> (8260B)	Field Parameters <sup>(1)</sup>	Water Level Gauging	<b>VOCs</b> (8260B)	Field Parameters <sup>(1)</sup>
MWC015	C-Sand	No.	х	x	X-	, <b>X</b> ,		
MWC016	C-Sand	No.	х	x	X.			
MWC017	C-Sand	Yes.	X	х	х	, <b>X</b> .	. <b>X</b> ,	, <b>X</b> .
MWC021	C-Sand	Yes	x	x	х	, <b>X</b> .	. <b>X</b> .	X
MWC022.	C-Sand	Yes	x	x	х	, <b>X</b> .	. <b>X</b> _	X
MWC023.	C-Sand	Yes	х	Х	х	, <b>X</b> .	, <b>X</b> ,	Χ.
MWC024	C-Sand	Yes.	х	х	х			
Gage Monitorii	ng Wells							
MWG001	Gage	Yes	ж	х	х	. <b>X</b> .	. <b>X</b> .	. <b>X</b> .
MWG002	Gage	Yes	·X	x	x	. <b>X</b> .	- <b>X</b> .	. <b>X</b> .
MWG003	Gage	Yes	·X	x	х	×X	Χ.	X
MWG004	Gage	Yes	х	х	х	٠X٠	· <b>X</b> .	·X·
Bioremediation	Monitoring Wel	ls						
IRZB0081	B-Sand	No:						
IRZB0095	B-Sand	No:						
IRZMW001A	B-Sand	No.	х	Х	х			
IRZMW001B	B-Sand	No.	х	х	х			
IRZMW002A	B-Sand	No.	х					
IRZMW002B	B-Sand	No.	х					
IRZMW003A	B-Sand	No.	х					
IRZMW003B	B-Sand	No.	х					
IRZMW004	B-Sand	No	.X	х	х			
IRZMW005.	B-Sand	No.	.X	Х	х			
IRZCMW001	C-Sand	Yes	.X	х	х			
IRZCMW002	C-Sand	Yes	·X	x	x			
IRZCMW003	C-Sand	Yes	Х	Х	х	- <b>X</b> -		
Quality Contro								
Duplicates (1 p				x (3)			x(2)	
	cs (1 per day) <sup>(3)</sup>			x (4)			x (2)	
Trip Blanks (1	per day)			<b>x</b> (.:6 )			x(4)	

#### Notes:

VOCs = volatile organic compounds using EPA Method 8260B

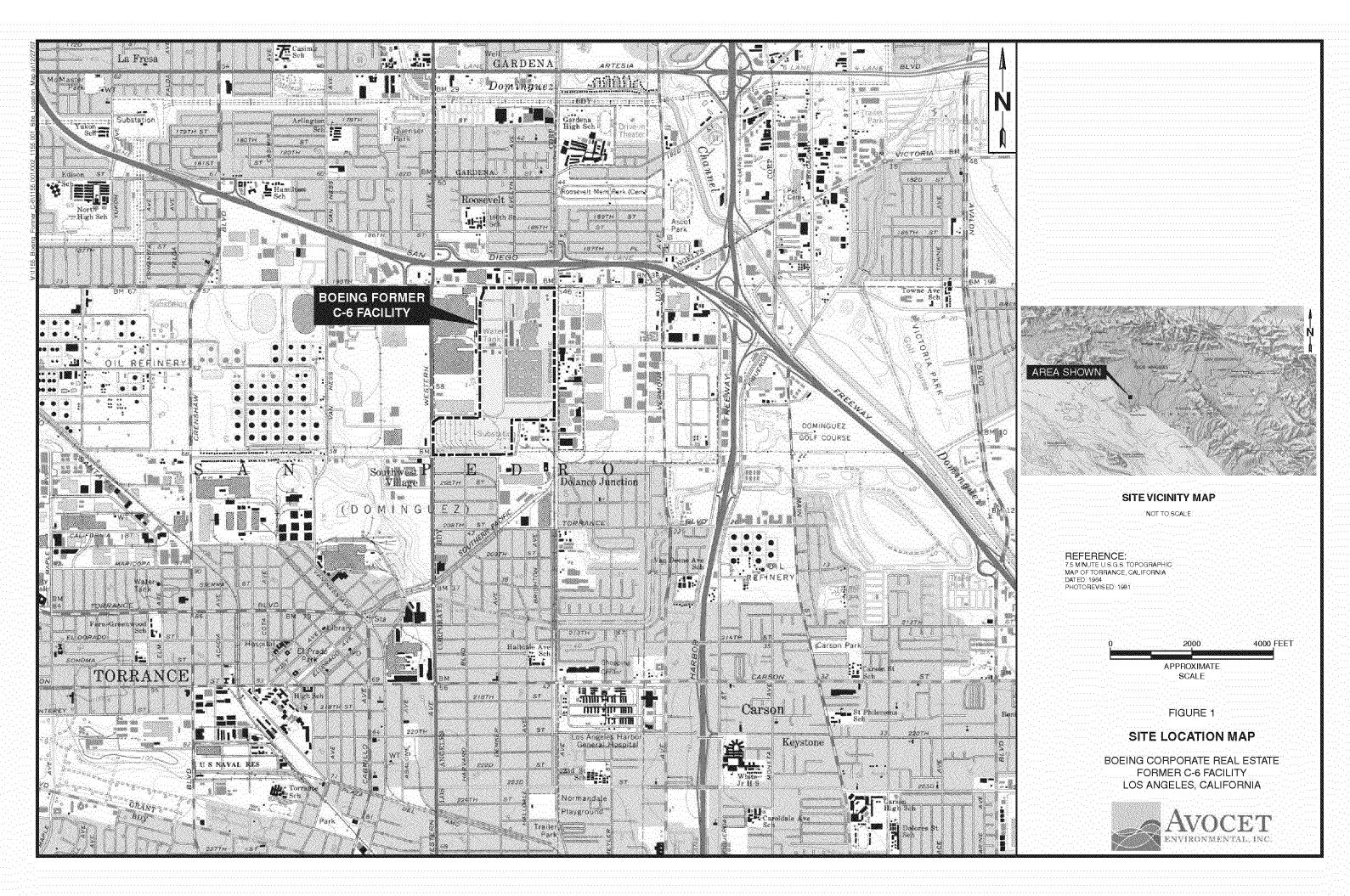
Field Parameters = pH, dissolved oxygen (DO), redox, turbidity, electrical conductivity, and temperature.

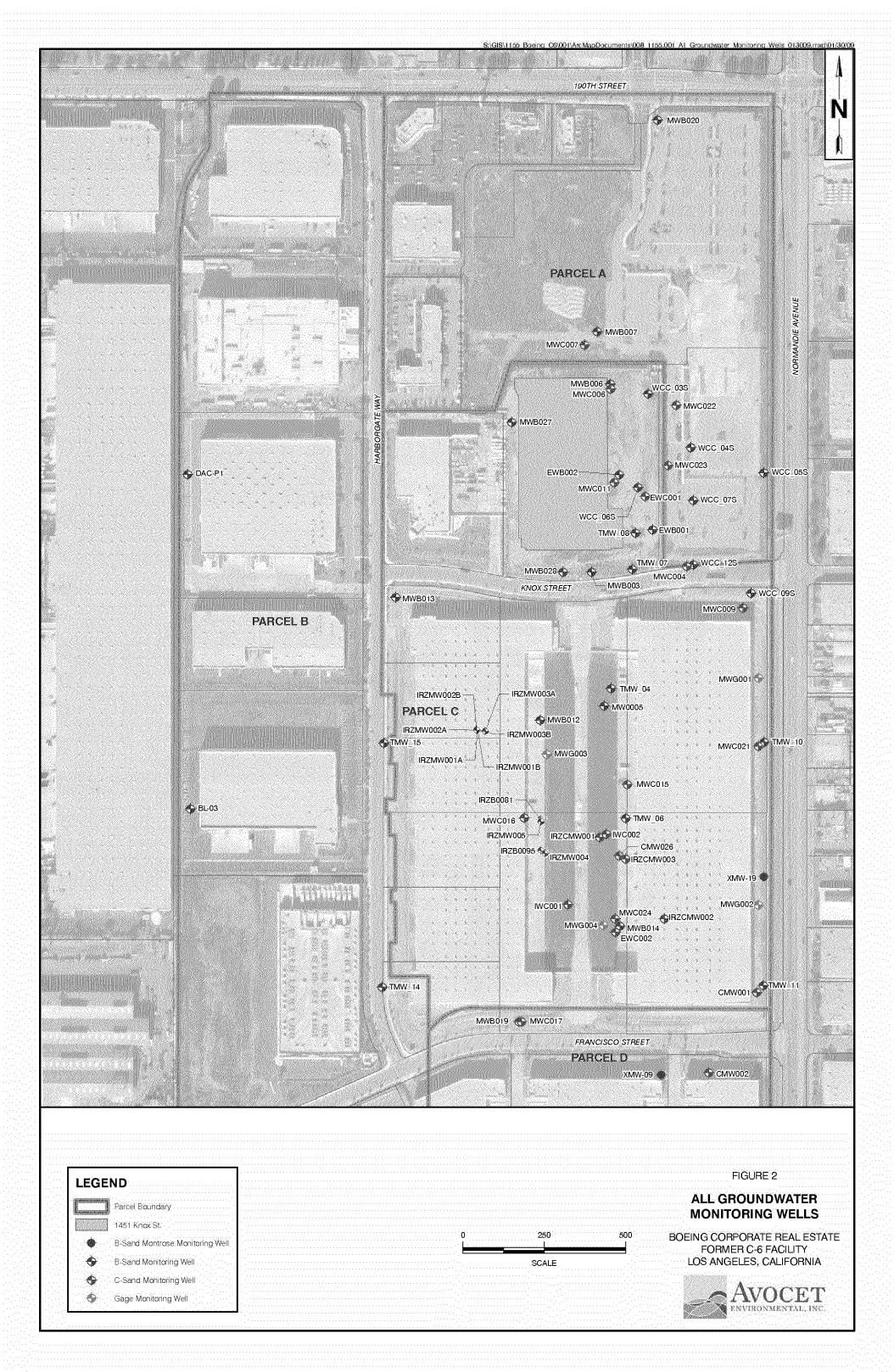
- (1) As a quality assurance check on DO measurements, 10 percent of the samples will be analyzed in the field using a CHEMetrics, Inc test kit (K-7512 or K-7540).
- (2) Quality control sample number based on estimated number of sampling days.
- (3) Since most of the wells have dedicated pumps/tubing, rinsate blanks will not be required every day.

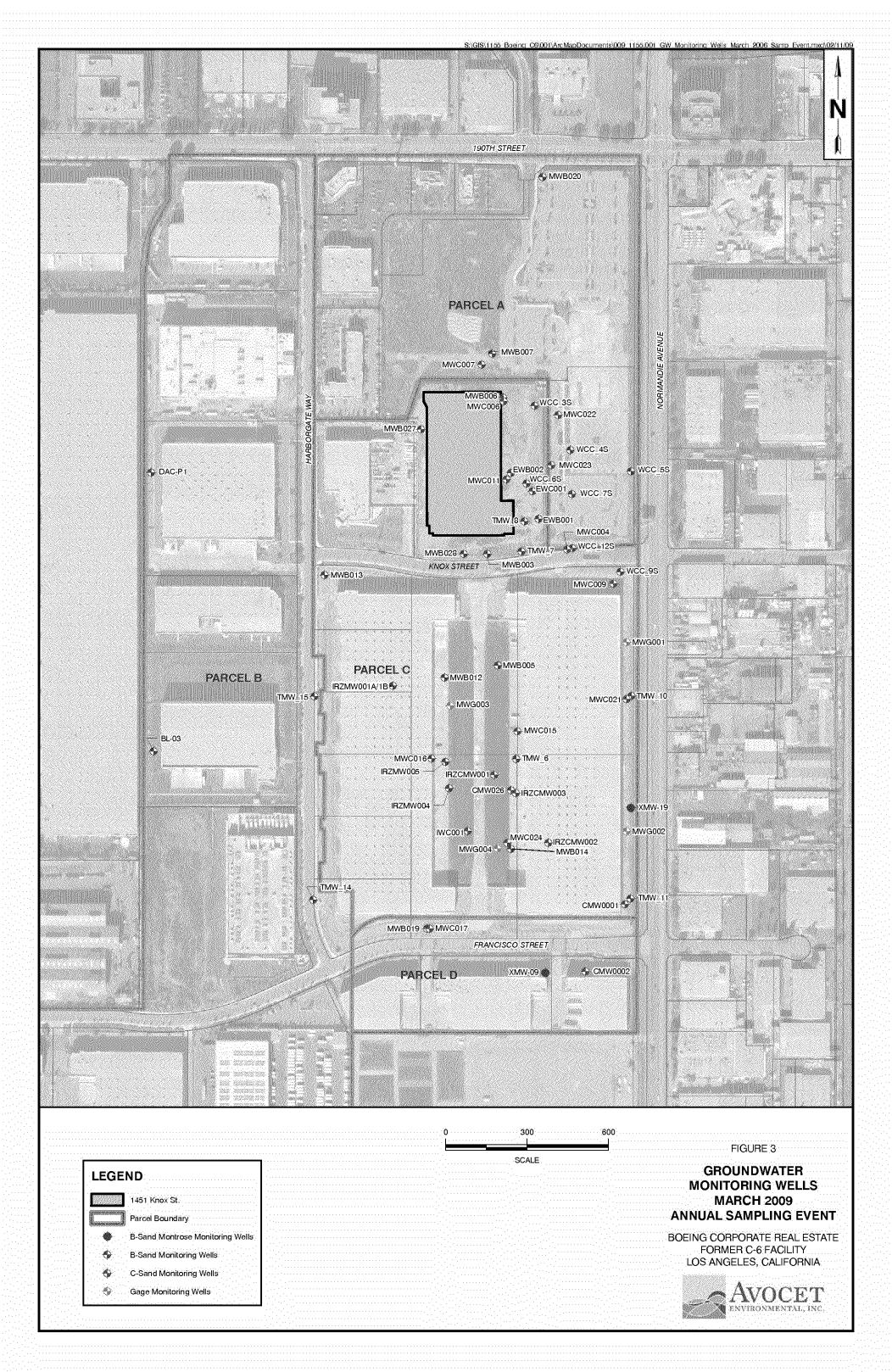


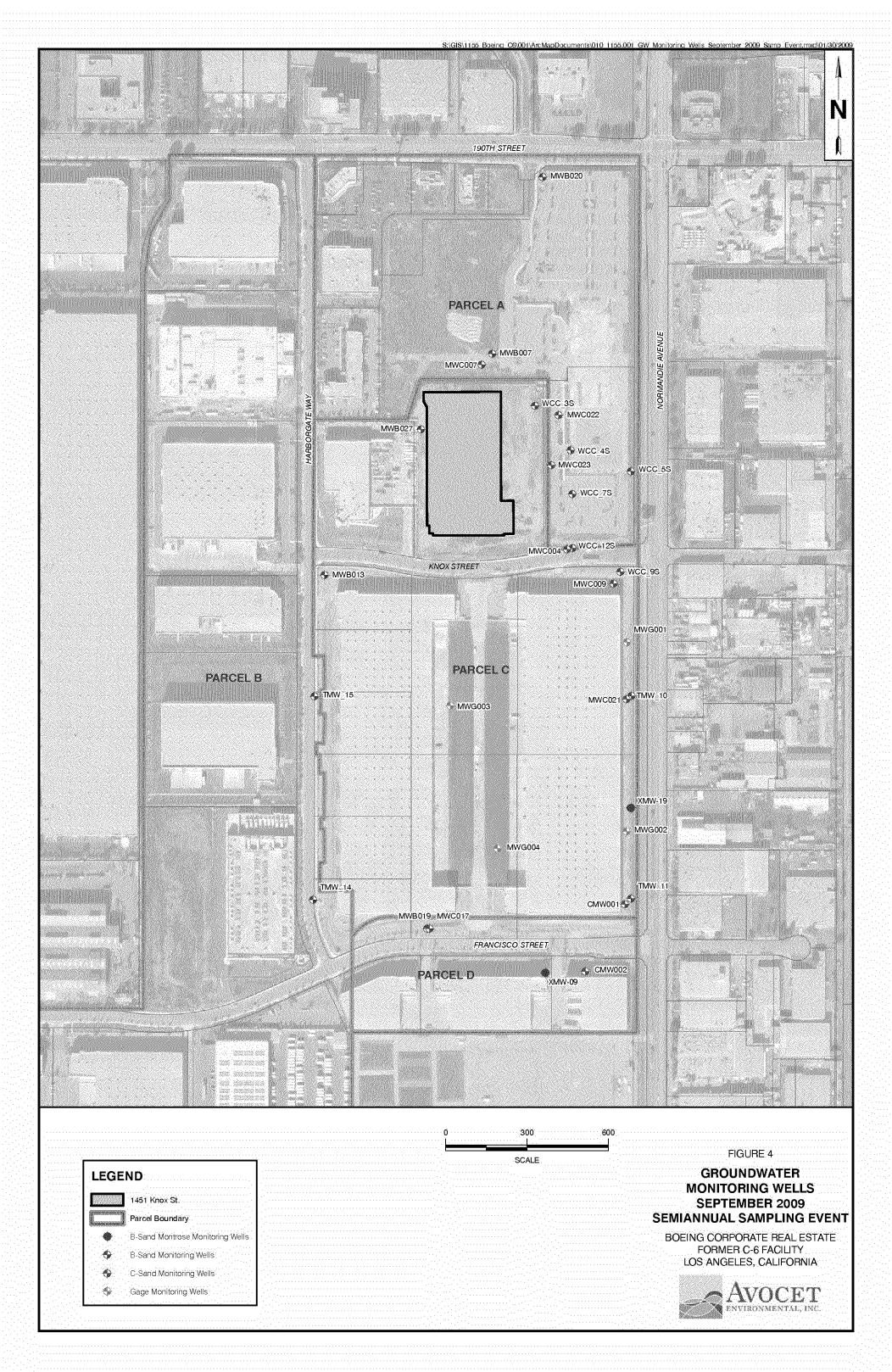












# Appendix A

Field Forms



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$\sim$	ENVIRONMENTAL, INC.
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## GROUNDWATER SAMPLING DATA SHEET

Project Nam	ie:	oeing (	C-6 GWM -	Sitewide		D	ate:							
Project No.:				1155.003				Р	repared	by:				
Well Identifi	cation:		J.	AW0075UB				.V	/eather:					
Measureme	nt Point Descri	ption:						P	ump Int	ake:		Screen	69	- 89
A	В			С	<b>D</b> = C	- B	E=	B - A	G	= D x F	<b>H</b> = 20 x	F [ I=	-B x F	
Depth to LNA (ft-bmp)	PL Depth to Water L	evel	Well T	otal Depth t-bmp)	Water Co Height			IAPL ness (ft)		e Casing ne (gallons)	Screen Volume (gallons)		Screen me (gal.)	Total Purge Volume (gal.)
										N/A	N/A		N/A	N/A
				Ga	lons/Foot			Field E	quipmer	it: QED				
Well Dia	a <b>meter</b> (inches) = :	<u>2</u>	0.75	5 2	4	6		Purge I	Method:	Micropurge	<b>)</b> ,			
F - Gallo	ns per foot of ca	sing	0.02	0.16	0.65	1.4	7:	Well Co	ondition:					
Time	Flow Controller Settings	Pu	lume irged iters)	Flow Rate (m⊡min)	Water Level (ft-bmp)	<b>Tempe</b> (°( [+/-1	C)	(mS	u <b>ctivity</b> 5/cm) 10%]	Dissolve Oxyger (mg/L) [+/- 10%	p <b>H</b> [+/- 0.1 pH	ORP (mV) [+/-10%]	Turbidity (NTU) [+/- 10%]	Observations
Purge Start Time	Purge End Time	FI	rage ow /min)	Total Volume Purged	Total Casing Volumes	Le	ecovery vel Dep	oth	Sampl	Level at ing Time bmp)	Sample Collection Time	s	ample Identif	ication
		VIII L	/111111)	(Liters)	Purged N/A	\L	NA	В	(11	omp)	ıme	AW0075HE	WG200903	3 01
Notes: (unit	s) [stabilization	.criteria	1			_  Field Para		3			DU			<u>, _</u> v i
Notes. (unit				Ferrous Iror	ı (mg/L)	PID (p	pm):	Che	emetrics D	).O.(mg/L)	DRUM N			

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## Groundwater Monitoring Well Gauging Sheet

Project Name: Boeing C-6 Sep-08 Gauging Event	Project Manager: Michael	Rendina <b>Project No.:</b>	1155.006
Location: Los Angeles, CA	Field Personnel:	Date:	:9/22/2008

Field Conditions:

Well ID	Previous Measurement Date	Previous Depth to Water	Date	Time	Well Diameter	PID (ppm)	Measurem ent Point	Depth to Water	Depth to Water #2	Change in DTW	Comments/Well Conditon
MWC007	Mar-08	58.18	9/22/08				TOC-N				
WCC_05S	Mar-08	59.45	9/22/08				TOC-N				
MWB020	Mar-08	57.15	9/22/08				TOC-N				
WCC_12S	Jun-08	58.07	9/22/08				TOC-N				
WCC_09S	Mar-08	61.92	9/22/08				TOC-N				
MWC022	Mar-08	58.41	9/22/08				TOC-N				
MWC004	Mar-08	59.03	9/22/08				TOC-N				
WCC_07S	Mar-08	59.27	9/22/08				TOC-N				
MW C023	Mar-08	58:01	9/22/08				TOC-N				
MWB007	Mar-08	57.95	9/22/08				TOC-N				
WCC_04S	Mar-08	59.08	9/22/08				TOC-N				
MWB013	Mar-08	62.21	9/22/08				TOC-N				
TMW_14	Mar-08	66.82	9/22/08				TOC-N				
TMW 15	Mar-08	64.89	9/22/08				TOC-N				
BL-03	Mar-08	66.28	9/22/08				TOC-N				
DAC-P1	Mar-08	61.75	9/22/08				TOC-N				
WCC_06S	Aug-08	.59.11	9/22/08				TOC-N				
AW0073C	Aug-08	60:05	9/22/08				TOC-N				
MWB027	Mar-08	63.67	9/22/08				TOC-N				
MWB028:	Mar-08	63.94	9/22/08				TOC-N				
TMW_07	Jun-08	60.78	9/22/08				TOC-N				
AW0067UB	Jun-08	58.52	9/22/08				TOC-N				
AW0074UB	Aug-08	59:34	9/22/08				TOC-N				
AW0066UB	Jun-08	58:98	9/22/08				TOC-N				
EWB002	Aug-08	60.38	9/22/08				TOC-N				
AW0077UB	<b>A</b> ug-08	60.64	9/22/08				TOC-N				

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## Groundwater Monitoring Well Gauging Sheet

Project Name: Boeing C-6 Sep-08 Gauging	Event Project Manager: Michael F	Rendina Project No.:	1155.006
Location: Los Angeles, CA	Field Personnel:	Date:	9/22/2008

Field Conditions:

Well ID	Previous Measurement Date	Previous Depth to Water	Date	Time	Well Diameter	PID (ppm)	Measurem ent Point	Depth to Water	Depth to Water #2	Change in DTW	Comments/Well Conditon
<b>AW</b> 0075UB	Aug-08	59.83	9/22/08				TOC-N				
AW0076,UB	<b>A</b> ug-08	60.37	9/22/08				TOC-N				
WCC_03S	Mar-08	59.35	9/22/08				TOC-N				
AW0064UB	Jun-08	58.85	9/22/08				TOC-N				
AW0055UB	<b>A</b> ug-08	60.1	9/22/08				TOC-N				
MWB006	<b>A</b> ug-08	60:32	9/22/08				TOC-N				
AW0065UB	Jun-08	59:32	9/22/08				TOC-N				
MW <sub>G</sub> 004	Mar-08	59.7	9/22/08				TOC-N				
MWG003	Mar-08	61.53	9/22/08				TOC-N				
TMW <u>.</u> 06	Mar-08	59.16	9/22/08				TOC-N				
CMW002	Mar-08	60.87	-9/22/08				TOC-N				
MWC015	Mar-08	59.89	9/22/08				TOC-N				
MWB014	Mar-08	59.24	9/22/08				TOC-N				
IRZCMW00.1	Mar-08	59.45	9/22/08				TOC-N				
CMW026	<b>A</b> ug-08	59.14	9/22/08				TOC-N				
MW0005:	Mar-08	59.37	9/22/08				TOC-N				
IRZCMW002	<b>A</b> ug-08	53:32	9/22/08				TOC-N				
IWC001	Mar-08	61.08	.9/22/08				TOC-N				
MW C024	<b>A</b> ug-08	59.24	.9/22/08				TOC-N				
EWC002	Feb-08	59.6	9/22/08				TOC-N				
IRZCMW003	<b>A</b> ug-08	59.17	9/22/08				TOC-N				
TMW_10.	Mar-08	57.12	9/22/08				TOC-N				
MWC021	Mar-08	61.93	9/22/08				TOC-N				
MWG001	Mar-08	62.69	9/22/08				TOC-N				
CMW001	Mar-08	62.52	9/22/08				TOC-N				
XMW-19	Mar-08	57.11	9/22/08				TOC-N				

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## **Groundwater Monitoring Well Gauging Sheet**

Project Name: Boeing C-6 Sep-08 Gauging Event	Project Manager:	Michael Rendina Project No.:	1155.006
Location: Los Angeles, CA	Field Personnel:	Date:	9/22/2008

Field Conditions:

Well ID	Previous Measurement Date	Previous Depth to Water	Date	 Well Diameter	PID (ppm)	Measurem ent Point	Depth to Water	Depth to Water #2	Change in DTW	Comments/Well Conditon
MWC009	Mar-08	61.34	9/22/08			TOC-N				
TMW_11	Mar-08	57.4	9/22/08			TOC-N				
MW G002	Mar-08	63.67	9/22/08			TOC-N				
MWC017	Mar-08	63.34	9/22/08			TOC-N				
MWB019	Mar-08	63.07	9/22/08		·	TOC-N		·		
XMW-09	Mar-08	61.99	9/22/08			TOC-N				

16 Technology Drive, Suite 154 Irvine, California 92618-2327 TEL (949) 296-0977 FAX (949) 296-0978

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Bosing CoC No. AVO121207A

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Project Information:					Ī								A	nalys	es									
Site Name Boeing Former Site Address Los Angeles, 0 1155.002 Project Manager Michael Rendir Sampled By Brian Barsumia Turn-Around-Time Standart TAT,	-	l oxys (EPA 8260B)	(09	VFA by IC Method 8M23G (Microseeps, Ing. Pittsburgh, PA)	Dissolved Gases (Ethane, Ethene, and Methane by RSK 175)	Dissolved Minerals (sulfate, Nitrate, nitrite, and chloride) by EPA Method 300	Total Alkalinity by EPA Method 310	Quantitative Polymerase Chain Reaction (qPCR) analysis for DHC 16S rRNA gene and functional genes toeA, bvcA, and vcrA (North Wind, Inc., Pocatello, ID)																
Sample Identification Sample Date Time			Matrix	No. of Cntnrs.	Lab I.D. Number		VOCs inc. fuel oxys (EPA	TOC (EPA 9060)	VFA by IC Me Microseeps, I	Dissolved Gas Methane by R	Dissolved Min nitrite, and chl	Total Alkalinit)	Quantitative P (qPCR) analys and functional vcrA (North W										Comments	
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EB_AV121207_0001	12/12/07		Water	3	1	t	Х											——————————————————————————————————————						
EWB002_WG121207_0001	12/12/07		Water	12			Х	х	х	X	Х	Х	·X					<del></del>				<del></del>	48HR HT for NO 3	
EWB001_WG121207_0001	12/12/07		Water	3			Х		+			-						<del> </del>						
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COC Seal (Y/N/NA)																								

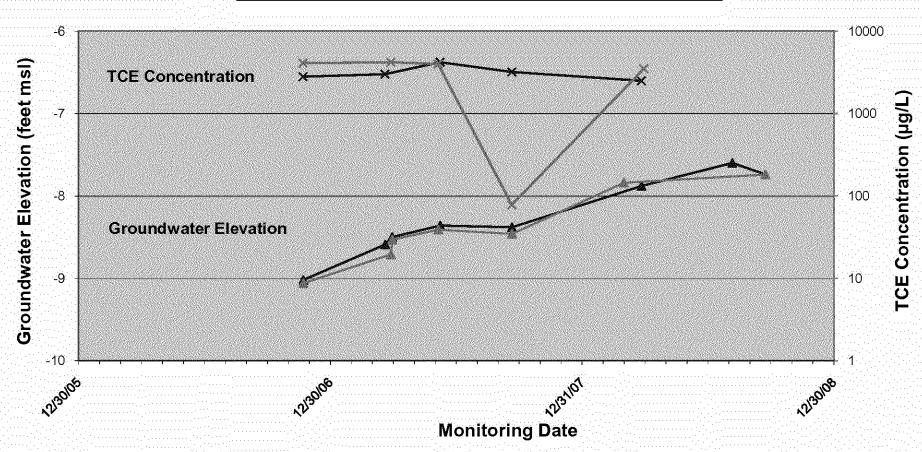
## Appendix B

Water Quality Hydrographs



## Well Comparison #1: MWC024 & EWC002 Well MWC024 is located approx. 40 feet north of EWC002

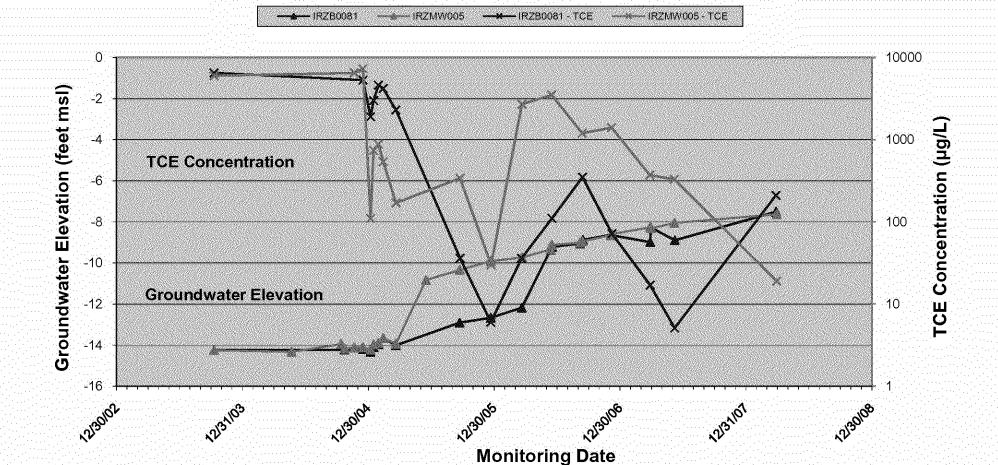






#### Well Comparison #2: IRZB0081 & IRZMW005

Well IRZB0081 is located approx. 6 feet north of IRZMW005

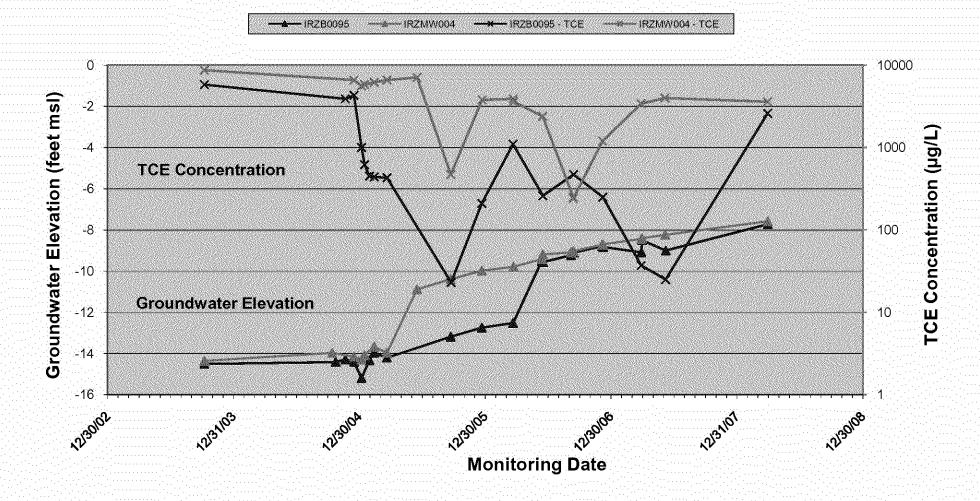


It is noteworthy that well IRZB0081 is a 0.75-inch diameter amendment well that has periodically been used for water quality monitoring. The discrepancy in results may be due to the fact that this well has received amendment injections in the past.



#### Well Comparison #3: IRZB0095 & IRZMW004

Well IRZB0095 is located approx. 16 feet northwest of IRZMW004



It is noteworthy that well IRZB0095 is a 0.75-inch diameter amendment well that has periodically been used for water quality monitoring. The discrepancy in results may be due to the fact that this well has received amendment injections in the past.



### Well Comparison #4: IWC002 & IRZCMW001

Well IWC002 is located approx. 23 feet northeast of IRZCMW001

